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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,613	10/26/2001	Steven R. Walther	V0077/7167WRM	9731

7590

04/08/2003

Gary L. Loser
Varian Semiconductor Equipment Associates, Inc.
35 Dory Road
Gloucester, MA 01930

EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-3

Office Action Summary

Application No.
10/005,613

Applicant(s)
Walther et al.

Examiner
Rodney McDonald

Art Unit
1753



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above, claim(s) 14-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

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DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-13, drawn to an apparatus, classified in class 204, subclass 298.05.
 - II. Claims 14-25, drawn to a method, classified in class 204, subclass 192.1+.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP. § 806.05(e)). In this case the apparatus can be used to practice another and materially different process such as one in which no pulses are applied to the anode.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with William McClellan on 1-7-03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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7. Claims 1-13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 and 28-33 of copending Application No. 10/007,530 in view of Liebert et al. (U.S. Pat. 6,020,592), Goeckner et al. (U.S. Pat. 6,182,604), Miyake et al. (U.S. Pat. 6,165,367) and Denholm et al. (U.S. Pat. 5,911,832).

This is a provisional obviousness-type double patenting rejection.

Application No. 10/007,530 teach a process chamber for enclosing a plasma doping chamber. The process chamber can be coupled to a first pump while the plasma doping chamber is coupled to a second pump. A workpiece platen is movable to establish a plasma doping environment and allows communication between the plasma doping chamber and the process chamber in a second mode. (See claims)

The difference between Application No. 10/007,530 and the present claims is that a chamber that is pulsed for plasma doping is not discussed, a hollow electrode surrounding the space between the anode and platen and being electrically connected to the anode is not discussed (As applies to claims 7 and 8), negative ions for implantation are not discussed (As applies to claim 11) and the platen being ground is not discussed (As applies to claim 12).

Liebert et al. teach a plasma doping apparatus which includes a plasma doping chamber, platen mounted in the plasma doping chamber for supporting a workpiece, a source of ionizable gas is coupled to the chamber, an anode spaced from the platen and a pulse source for applying high voltage pulses between the platen and the anode. The high voltage pulses produce a plasma

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sheath in the vicinity of the workpiece. The high voltage pulses accelerate positive ions across the plasma sheath toward the platen for implantation into the workpiece. (See Abstract)

Figure 1 shows a plasma doping chamber 10 defining an enclosed volume 12. A platen 14 positioned within chamber 10 provides a surface for holding a workpiece. The platen 14 supports wafer 20 and provides an electrical connection to the wafer 20. (Column 4 lines 32-39)

An anode 24 is positioned within chamber 10 in spaced relation to platen 14. Anode 24 may be moveable in a direction indicated by arrow 26, perpendicular to platen 14. The anode 24 is typically connected to electrically-conductive walls of chamber 10, both of which may be connected to ground. (Column 4 lines 44-49)

The wafer 20 and the anode 24 are connected to a high voltage pulse generator 30, so that wafer 20 functions as a cathode. (Column 4 lines 50-53)

The enclosed volume 12 of chamber 10 is coupled through a controllable valve 32 to a vacuum pump 34. A gas source 36 is coupled through a mass flow controller 38 to chamber 10. (Column 4 lines 58-61)

As known in the art, the plasma 40 contains positive ions of the ionizable gas from gas source 36. The plasma 40 further includes a plasma sheath 42 in the vicinity of platen 14. The electric field that is present between anode 24 and platen 14 during the high voltage pulse accelerates positive ions from plasma 40 across plasma sheath 42 toward platen 14. The accelerated ions are implanted into wafer 20 to form regions of impurity material. The pulse

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voltage is selected to implant the positive ions to a desired depth in wafer 20. (Column 5 lines 19-28)

The motivation for utilizing pulsed plasma doping is that it allows for implantation into a substrate. (Column 1 lines 5-10)

Goeckner teach a plasma doping apparatus includes a hollow cathode to increase throughput and uniformity of ion implantations in a target. The hollow cathode is located adjacent an anode and a target cathode on which a target is placed. An ionizable gas is provided in a space between the anode and the target cathode. The space in which the ionizable gas is provided is surrounded by the hollow cathode. The hollow cathode has either a circular or rectangular cross-section. (See Abstract) The elements are electrically connected through the plasma.

The motivation for utilizing a hollow electrode surrounding the space between the anode and platen is that it allows for increasing throughput and uniformity of ion implantation. (See Abstract)

Miyake et al. Teach pulsing and implanting negative ions into a substrate. (Column 3 lines 19-26)

The motivation for implanting negative ions is that it allows for preventing damage to the workpiece even if there is an insulating portion. (Column 2 lines 25-31)

Denholm et al. teach in Figure grounding the substrate holder and applying pulses to the anode so that gas molecules are ionized to be implanted. (See Figure 1; Abstract)

The motivation for grounding the workpiece for implantation of ions is that it allows for facilitating the mechanical scanning of workpieces. (Column 3 lines 22-25)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified 10/007,530 by is pulsing for plasma doping as taught by Liebert et al, to have utilized a hollow electrode surrounding the space between the anode and platen and being electrically connected to the anode as taught by Goeckner et al., to have utilized negative ions for implantation as taught by Miyake et al. and to have utilized a grounded platen as taught by Denholm et al. because it allows for implantation with uniformity, low damage and mechanical scanning.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney McDonald whose telephone number is 703-308-3807. The examiner can normally be reached on M-Th from 8 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen, can be reached on (703) 308-3324. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



RODNEY G. MCDONALD
PRIMARY EXAMINER

RM

April 4, 2003

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-13, drawn to an apparatus, classified in class 204, subclass 298.05.
- II. Claims 14-25, drawn to a method, classified in class 204, subclass 192.1+.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used to practice another and materially different process such as one in which no pulses are applied to the anode.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation between examiner Luz Alejandro and William McClellan on 01/07/03 a provisional election was made with traverse to prosecute the invention of group I, claims 1-13. Affirmation of this election must be made by applicant

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in replying to this Office action. Claims 14-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).